

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 020057PC	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/SE03/00379	International filing date (<i>day/month/year</i>) 06.03.2003	Priority date (<i>day/month/year</i>) 05.04.2002	
International Patent Classification (IPC) or national classification and IPC ⁷ C04B 35/58, C22C 29/18, H05B 3/14			
Applicant SANDVIK AB et al			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 07.08.2003	Date of completion of this report 05.11.2003
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Ulrika Nilsson/MP Telephone No. 08-782 25 00

I Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed
- ☒ the description:
pages 1-5, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under article 19
pages _____, filed with the demand
pages 6-7, filed with the letter of 24.10.2003
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language english which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-9</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-9</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-9</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This statement is based on the claims 1-9 filed with the letter of October 24, 2003.

The following documents are cited in the International Search Report:

US 3 269 806 A (ERICH FITZER ET AL)
SE 204 116 A (AB KANTHAL)
US 4 555 358 A (YASUO MATSUSHITA ET AL)
GB 795 004 A (SIEMENS-PLANIAWERKE AKTIENGESELLSCHAFT)

The documents cited in the International Search Report are considered to represent the general state of the art.

The invention defined in amended claims 1-9 is not disclosed by these documents.

The cited documents do not give any indication that would lead a person skilled in the art to the claimed method or electrical heating element. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-9 is novel and is considered to involve an inventive step. The invention is also industrially applicable.

CLAIMS

1. A method of producing a heating element that is comprised essentially of molybdenum silicide type and alloys of this basic material, characterised by producing a material that contains substantially $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$ and Al_2O_3 by mixing a molybdenum aluminium silicide $\text{Mo}(\text{Si}_{1-y}\text{Al}_y)_2$ with SiO_2 , wherein the SiO_2 is at least 98% pure.
2. A method according to Claim 1, characterised in that the SiO_2 is present in silicates, such as mullite and sillimanite, which do not effect the symmetry of the crystal lattice of molybdenum silicide.
3. A method according to Claim 1 or 2, characterised in that x is caused to lie in the range of 0.4 - 0.6.
4. A method according to Claim 1 or 2, characterised in that x is caused to lie in the range of 0.45 - 0.55.
5. A method according to Claim 1, 2, 3 or 4, characterised by substituting molybdenum partly with Re or W in the material $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$.
6. A electrical heating element that is comprised substantially of the molybdenum silicide type and alloys of this basic material, characterised in that said element is comprised chiefly of the materials $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$ and Al_2O_3 , wherein SiO_2 having a purity of at least 98% is added during the production process.
7. A heating element according to Claim 5, characterised in that x lies in the range of 0.4 - 0.6.

8. A heating element according to Claim 7, c h a r a c -
t e r i s e d in that x is caused to lie in the range of 0.45
- 0.55.

9. A heating element according to Claim 5, 6, 7 or 8,
c h a r a c t e r i s e d in that molybdenum in the material
 $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$ is replaced partially with Re or W.